

## WHAT IS CLAIMED IS:

1. A light deflector having a light input surface for receiving incident light and a light output surface for emitting 5 incident light, the light output surface being located on the opposite side to the light input surface, the light input surface having a plurality of elongated prisms arranged in parallel to each other, each having two prism faces, characterized in that at least one of the two prism faces is a non-single planar surface, and a 10 vertex split angle  $\alpha$  of one of the prism faces which form each of the elongated prisms is 2 to 25 degrees while a vertex split angle  $\beta$  of the other of the prism faces is 33 to 40 degrees, a difference ( $|\alpha - \beta|$ ) between the vertex split angle  $\alpha$  and the vertex split angle  $\beta$  being 8 to 35 degrees.

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2. The light deflector as claimed in claim 1, wherein the vertex split angle  $\alpha$  is between 11 and 25 degrees.

3. The light deflector as claimed in claim 1, wherein one 20 of the two prism faces is a non-single planar surface and the other of the prism faces is a single planar surface.

4. The light deflector as claimed in claim 1, wherein the non-single planar surface has at least a convex curved surface.

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5. The light deflector as claimed in claim 4, wherein the non-single planar surface has two or more convex curved surfaces with different inclination angles.

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6. The light deflector as claimed in claim 1, wherein the non-single planar surface has two or more planar surfaces with different inclination angles.

5 7. The light deflector as claimed in claim 1, wherein the non-single planar surface has both one or more planar surfaces and one or more convex curved surfaces.

10 8. The light deflector as claimed in any one of claims 5 to 7, wherein, in the non-single planar surface, one of the planar surfaces or one of the convex curved surfaces positioned at the side close to the light output surface has larger inclination angle.

15 9. The light deflector as claimed in claim 8, wherein, in the non-single planar surface, a difference between an inclination angle of one of the planar surfaces or one of the convex curved surfaces closest to a vertex of each of the elongated prisms and an inclination angle of the other of the planar surfaces or the other of the convex curved surfaces closest to the light output 20 surface is 1 to 15 degrees.

25 10. The light deflector as claimed in any one of claims 5 to 7, wherein a direction of peak in a distribution of light totally reflected by each of the planar surfaces and/or each of the convex curved surfaces of the non-single planar surface and emitted from the light output surface substantially agrees with a normal direction of a plane on which the elongated prisms are formed.

11. The light deflector as claimed in any one of claims 4, 6

and 7, wherein a ratio ( $r/P$ ) of a radius of curvature ( $r$ ) of each of the convex curved surfaces of the non-single planar surface relative to a pitch ( $P$ ) of the elongated prisms is 2 to 50.

5 12. The light deflector as claimed in claim 1, wherein a ratio ( $d/P$ ) of a maximum distance ( $d$ ) from the non-single planar surface to a virtual plane connecting a vertex and a bottom of each of the elongated prisms to each other relative to a pitch ( $P$ ) of the elongated prisms is 0.4 to 5%.

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13. The light deflector as claimed in claim 1, wherein, if a coordinate system is adopted in a cross section of the elongated prisms in which a vertex of each of the elongated prisms is assumed to be an origin of the coordinate system and a length of a pitch 15  $P$  of the elongated prisms is normalized to 1, each of the elongated prisms shows in the cross section thereof a profile formed by connecting in order the adjacent two of sixteen (16) points of point 1 (-0.111, 1.27), point 2 (0.0, 0.0), point 3 (0.159, 0.195), point 4 (0.212, 0.260), point 5 (0.265, 0.328), point 6 (0.319, 0.398), 20 point 7 (0.372, 0.470), point 8 (0.425, 0.544), point 9 (0.478, 0.621), point 10 (0.531, 0.699), point 11 (0.584, 0.780), point 12 (0.637, 0.861), point 13 (0.690, 0.945), point 14 (0.743, 1.030), point 15 (0.796, 1.117) and point 16 (0.889, 1.27) or their neighborhood points to each other.

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14. The light deflector as claimed in claim 13, wherein, if the length of the pitch  $P$  of the elongated prisms is normalized to 1 in a cross section thereof, each of the elongated prisms shows in the cross section thereof the profile formed with use of the

neighborhood points located within a circle of a radius of 0.021 centered at the corresponding points as to at least five points of the sixteen (16) points.

5       15. The light deflector as claimed in claim 1, wherein, if a coordinate system is adopted in a cross section of the elongated prisms in which a vertex of each of the elongated prisms is assumed to be an origin of the coordinate system and a length of a pitch  $P$  of the elongated prisms is normalized to 1, each of the elongated  
10 prisms shows in the cross section thereof a profile formed by connecting in order the adjacent two of thirteen (13) points of point 1 (-0.206, 1.168), point 2 (0.000, 0.000), point 3 (0.159, 0.204), point 4 (0.212, 0.273), point 5 (0.265, 0.343), point 6 (0.319, 0.416), point 7 (0.372, 0.490), point 8 (0.425, 0.567),  
15 point 9 (0.478, 0.646), point 10 (0.531, 0.727), point 11 (0.584, 0.810), point 12 (0.637, 0.897) and point 13 (0.794, 1.168) or their neighborhood points to each other.

20       16. The light deflector as claimed in claim 15, wherein, if the length of the pitch  $P$  of the elongated prisms is normalized to 1 in a cross section thereof, each of the elongated prisms shows in the cross section thereof the profile formed with use of the neighborhood points located within a circle of a radius of 0.021 centered at the corresponding points as to at least five points  
25 of the thirteen (13) points.

17. The light deflector as claimed in claim 1, wherein, if a coordinate system is adopted in a cross section of the elongated prisms in which a vertex of each of the elongated prisms is assumed

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to be an origin of the coordinate system and a length of a pitch P of the elongated prisms is normalized to 1, each of the elongated prisms shows in the cross section thereof a profile formed by connecting in order the adjacent two of twelve (12) points of point 5 1 (-0.284, 1.059), point 2 (0.000, 0.000), point 3 (0.212, 0.278), point 4 (0.265, 0.350), point 5 (0.319, 0.423), point 6 (0.372, 0.501), point 7 (0.425, 0.581), point 8 (0.478, 0.663), point 9 (0.531, 0.748), point 10 (0.584, 0.834), point 11 (0.637, 0.922) and point 12 (0.716, 1.059) or their neighborhood points to each 10 other.

18. The light deflector as claimed in claim 17, wherein, if the length of the pitch P of the elongated prisms is normalized to 1 in a cross section thereof, each of the elongated prisms shows 15 in the cross section thereof the profile formed with use of the neighborhood points located within a circle of a radius of 0.021 centered at the corresponding points as to at least five points of the twelve (12) points.

20 19. The light deflector as claimed in claim 1, wherein a pitch P of the elongated prisms and a length L2 of a virtual straight line connecting a vertex and a trough section of each of the elongated prisms to each other in a cross section thereof as to one of the prism faces of the vertex split angle  $\beta$  of each of the 25 elongated prisms shows a relationship of  $L2 / P = 1.1$  to 1.7.

20. The light deflector as claimed in claim 1, wherein a length L1 of a virtual straight line connecting a vertex and a trough section of each of the elongated prisms each other in a cross section

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thereof as to one of the prism faces of the vertex split angle  $\alpha$  of each of the elongated prisms and a length  $L_2$  of a virtual straight line connecting a vertex and a trough section of each of the elongated prisms to each other in a cross section thereof as to 5 the other of the prism faces of the vertex split angle  $\beta$  of each of the elongated prisms shows a relationship of  $L_2 / L_1 = 1.1$  to 1.3.

21. The light deflector as claimed in claim 1, wherein, if 10 a length of a pitch  $P$  of the elongated prisms is normalized to 1, an edge line formed by the two prism faces of each of the elongated prisms is undulated by 0.018 to 0.354 relative to its base line.

22. The light deflector as claimed in claim 1, wherein, if 15 a length of a pitch  $P$  of the elongated prisms is normalized to 1, the two prism faces of each of the elongated prisms are undulated by 0.012 to 0.334 relative to their respective base planes.

23. The light deflector as claimed in claim 1, wherein a flat 20 section is arranged between the adjacent two of the elongated prisms.

24. The light deflector as claimed in claim 23, wherein the flat section is arranged at a position vertically separated from 25 the trough section of each of the elongated prisms by 2 to 10  $\mu$  m.

25. The light deflector as claimed in claim 23, wherein, if a length of a pitch  $P$  of the elongated prisms is normalized to 1,

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the flat section is arranged at a position vertically separated from a trough section of each of the elongated prisms by 0.035 to 0.18.

5        26. The light deflector as claimed in claim 23, wherein, if a length  $L_2$  of a virtual straight line connecting a vertex and a trough section of each of the elongated prisms to each other in a cross section thereof as to one of the prism faces of the vertex split angle  $\beta$  of each of the elongated prisms is normalized to 1,  
10      the flat section is arranged at a position vertically separated from the trough section of each of the elongated prisms by 0.022 to 0.16.

15      27. A light deflector having a light input surface for receiving incident light and a light output surface for emitting incident light, the light output surface being located on the opposite side to the light input surface, the light input surface having a plurality of elongated prisms arranged in parallel to each other, each having two prism faces, characterized in that at least 20      one of the two prism faces is a non-single planar surface, and a vertex split angle  $\alpha$  of one of the prism faces which form each of the elongated prisms is 2 to 25 degrees while a vertex split angle  $\beta$  of the other of the prism faces is 33 to 40 degrees, and that, if a length of a pitch  $P$  of the elongated prisms is normalized to 25      1, an edge line formed by the two prism faces of each of the elongated prisms is undulated by 0.018 to 0.354 relative to its base plane.

28. A light deflector having a light input surface for receiving incident light and a light output surface for emitting

incident light, the light output surface being located on the opposite side to the light input surface, the light input surface having a plurality of elongated prisms arranged in parallel to each other, each having two prism faces, characterized in that at least 5 one of the two prism faces is a non-single planar surface, and a vertex split angle  $\alpha$  of one of the prism faces which form each of the elongated prisms is 2 to 25 degrees while a vertex split angle  $\beta$  of the other of the prism faces is 33 to 40 degrees, and that, if a length of a pitch  $P$  of the elongated prisms is normalized to 10 1, the two prism faces of each of the elongated prisms are undulated by 0.012 to 0.334 relative to their respective base planes.

29. A light source device comprising: a primary light source; a light guide having a light incident surface for receiving 15 light emitted from the primary light source, guiding an incident light and having a light emitting surface for emitting a guided light; and the light deflector as claimed in any one of claims 1 to 7, 9 and 12 to 28 arranged with its light input surface located vis-à-vis the light emitting surface of the light guide.

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30. The light source device as claimed in claim 29, wherein the light deflector is arranged with one of the prism faces of the vertex split angle  $\alpha$  of each of the elongated prisms located close to the primary light source and with the other of the prism faces 25 of the vertex split angle  $\beta$  of each of the elongated prisms located remotely from the primary light source.

31. The light source device as claimed in claim 29, wherein the primary light source is arranged adjacent to a corner section

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of the light guide and the elongated prisms of the light deflector are arranged substantially concentrically and centered substantially at the primary light source.

5 32. The light source device as claimed in claim 29, wherein a light diffuser is arranged adjacent to the light output surface of the light deflector with a full width at half maximum of a distribution of emitted light showing anisotropy when receiving collimated light.

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